Splash!

quick facts on ...

Feasibility Study on Seawater Desalination

Alternative Source of Potable Water for South Florida

The South Florida Water Management District *(SFWMD) is a regional, governmental agency that oversees the water resources in the southern half of the state. It is the oldest and largest of the state's five water management districts.*

Our mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply.

Reverse Osmosis (RO) *Seawater and salty waters of inland seas, highly mineralized groundwaters, and municipal wastewaters contain dissolved substances. Desalination makes such otherwise unusable waters fit for human consumption, irrigation, industrial use, and other purposes. Distillation is the most widely used desalination process; use of electrodialysis and reverse osmosis is also increasing.*

Reverse Osmosis purifies saltwater by forcing it through semi-permeable membranes, leaving behind impurities of heavy metals and compounds such as leads and nitrates to be disposed of as reject.

A *feasibility study for co-locating RO treatment facilities with electric power plants* was initiated in February 2001 by the District and cosponsored by Florida Power & Light Company (FPL). Water Resources Associates Inc. of Tampa, performed the feasibility study at the cost of about $195,000.

Background

Imagine you figured out an alternative way to augment your potable water supply during drought periods. And this was at reduced cost with no restriction on water use. This search for alternative sources is part of the Regional Water Supply Initiative undertaken by the District.

The objective of the feasibility study was to evaluate the technical, regulatory, and economic feasibility of co-locating seawater or brackish RO treatment facilities with electric power plants. The product water is blended with existing water sources for potable water supply. The major benefits of co-location include:

- Environmental - ability to dispose of the desalination process concentrate by blending with cooling water discharged from the power plant. This process has recently been permitted by the FDEP for a similar RO project by Tampa Bay Water.
- Cost savings by using existing and permitted intake and discharge structures to provide raw water and concentrate outfall.
- Shared land, labor, public financing, and existing potable water distribution facilities, further reduced operational and maintenance costs.

Methodology

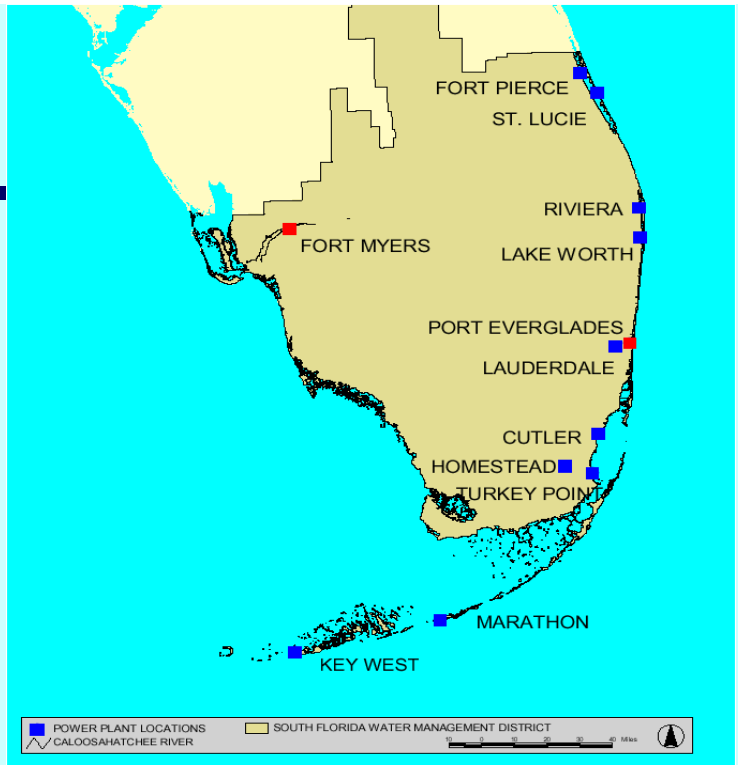
The study used a three-step process to evaluate 23 existing and planned electric power plants located within the District service area. Factors that favored the selection of sites included lower salinity and ample quantities of cooling water, extended life span of power plant, adequate land availability, proximity to major utility transmission line, and increasing potable water demand in the service areas.

The study recommended two "desirable" and technically feasible FPL sites for a more detailed evaluation and cost analysis. These were the Ft. Myers Power Plant in Lee County on the Caloosahatchee River, and Port Everglades Power Plant in Broward County on the Intercoastal Waterway.

Estimated costs per 1000 gallons of product water at both sites were comparable to those of the Tampa Bay Water's Big Bend project.

Roles of the Power Company, Utilities Company, and SFWMD

- FPL will lease existing infrastructure and sell electric power to RO Plant.
- Lee County Utilities (LCU) will purchase real estate and easements for the RO facility, design, build, and operate the plant for potable water supply.
- The SFWMD will act as a facilitator and provide regulatory and funding assistance.



Study Conclusions

- Seawater desalination by RO may be a technically feasible water supply source for south Florida, offering high quality and sustainable source of potable water. This alternative water source could help meet future demands especially during periods of drought. It is not affected by climatic conditions.

Future Developments

- There are ongoing discussions with FPL, LCU, and SFWMD for potential Phase II feasibility study, conceptual design, and project implementation.
- The target quantity of RO water to be produced at the planned Fort Myers facility is 30 million gallons per day. This may be achieved in stages.
- Workshops have been planned with FPL, and LCU. The SFWMD will continue to facilitate discussions and implementation of agreements.

District Info